MEMORANDA RELATING TO THE UGANDA RAILWAY.

1902.

THE history of this undertaking, prior to the passing of the Uganda Railway Act of 1896, is contained in Parliamentary Papers "Africa No. C. 6560 (1892)," "No, C. 7025 (1893)," "No. C. 7833 (1895)," "No. C. 8049 (1896)," and subsequent to that Act in the annual Reports presented to Parliament (C. 8435 of 1897, C. 8942 of 1898, C. 9333 of 1899, Cd. 355 of 1900, Cd. 674 of 1901, and Cd. 1080 of 1902), Sir Guilford Molesworth's Report C. 9331 of 1899, Memoranda relating to Uganda Railway 1900, Cd. 97 of 1900, and Colonel Gracey's Report, Cd. 670 of 1901.

When in August 1895 the duty of constructing the Railway was confided to a Committee, it became evident to them at an early period that at least some of the works provided for in the reconnaissance estimate of 1893 were insufficient, but being without detailed plans, it was impossible for them to estimate the total expenditure that might be necessary to carry out the undertaking. This could be determined only when surveys and levels were completed, the actual length to be constructed known, and the conditions of labour, &c., ascertained. In the circumstances the Government of Her late Majesty considered it best to ask for a grant of three millions to begin with, but with the knowledge that extra moneys would be necessary later on.

The complete survey then undertaken showed as it progressed that many minor improvements in location could with advantage be made, and that the total length could be considerably shortened by crossing the Mau range at another point to the southward of that originally projected, thus reaching the shore of Lake Victoria at the nearest possible point.

The care with which the surveys have been carried out is proved by the Reports by Sir Guilford Molesworth (Parliamentary Paper C. 9331 of 1899) and Colonel Gracey (Parliamentary Paper Cd. 670 of 1901).

These final surveys and sections were not completed until April 1900, and the plans, &c., did not reach England until August 1900. In the meantime, the Parliamentary grant was exhausted, and it became necessary to apply to Parliament for further funds. The Committee then, in consultation with the Chief Engineer, prepared an estimate from such data as were procurable. This estimate has proved inadequate. The details of the excess, and the reasons for it, are shown in the Report of the Managing Member of the Uganda Railway Committee, which is appended to this Memorandum.

Present State of the Works.

The rails were laid through to Lake Victoria on the 20th December, 1901, but were for some distance on temporary deviations and on temporary bridges. At this date, with one unimportant exception, the rails are on the permanent formation up to mile 495, and also over a good many miles out of the remaining 89.

The earthworks and bridging on the unfinished portion are making good progress, and should be completed before the end of the present financial year. It is possible however, that in the future the bridging may need certain additions. The experience of several years will be required to determine accurately the maximum amount of waterway which must be provided. The works that will then remain unfinished are mostly connected with ballasting on certain portions of the Railway, and with water supply. On this head definite proposals cannot be put forward until sources of perennial supply have been discovered, and the minimum amount obtainable from them can be roughly ascertained. Meanwhile, water-tanks have to be hauled long distances by train.

Traffic.

Until the present year the gross receipts from Government and public traffic were encouraging, and had risen to an amount representing about 4*l.* per mile per week,

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but the outbreak of plague in East Africa temporarily checked enterprise, and consequently the amount has fallen off. When, however, the steamers now being put together at the Lake terminus are in working order and commence a regular service, it is anticipated that traffic will receive a considerable impetus.

The following Tables show some of the results of working:—

PUBLIC Traffic (excluding carriage of Protectorate Stores and Railway Construction).

Head.	Total Receipts.	
	1900.	1901.
Mean mileage worked	391·70	507·57
Coaching traffic—	£	£
Passengers	11,661	12,772
,, luggage	969	662
Carriages, horses, dogs, &c.	251	226
Miscellaneous	2	5
	12,883	13,665
Goods traffic—		
Merchandize	36,153	44,903
Live stock	136	170
Miscellaneous	96	617
Total	36,385	45,690

ABSTRACT.

Head.	Total Receipts.	
	1900.	1901.
	£	£
Coaching receipts	12,883	13,665
Goods receipts	36,385	45,690
Total natural traffic	49,268	59,355

TRAFFIC Earnings (including Protectorate Stores), but excluding Railway Stores.

Head.	1900.	1901.
	£	£
Coaching traffic	19,494	25,211
Goods traffic..	43,027	53,269
Electric telegraph	3,286	1,842
Sundries	89	475
Total	65,896	80,797

GROSS Working Expenditure (including Maintenance and Carriage of Railway Stores, &c.).

1900.	1901.
£	£
350,393	378,891

APPENDIX.

Memorandum by the Managing Member of the Uganda Railway Committee.

The Committee's first Estimate was prepared at the end of 1899, and is shown in the first column of the attached Table. It was based on an Estimate prepared by the Chief Engineer, who used the known cost of the portion of the line then practically finished to obtain a mileage rate for each main head of Estimate.

COMPARISON of Estimates.

Head.	Uganda Railway Committee's Original Estimate, framed in December 1899, for completed Railway.	Uganda Railway Committee's Revised Estimate for placing the Rails on the Permanent Alignment.	Increase.	Decrease.
	Amount.	Amount.		
	£	£	£	£
Surveys	80,747	82,070	1,323	..
Land	26,211	25,285	..	926
Formation (earthworks, &c.) ..	844,607	1,152,403	307,796	..
Bridge-work	669,670	740,281	70,611	..
Level crossings, fencing, &c. ..	11,710	16,979	5,269	..
Telegraph	57,977	61,023	3,046	..
Permanent way	1,379,690	1,453,553	73,863	..
Ballast	349,199	276,498	..	72,701
Stations and buildings (including workshops)	371,458	570,365	198,907	..
Plant	195,300	100,700	..	94,600
Rolling-stock	400,000	528,843	128,843	..
Jetties	28,000	28,000	..	..
General charges (including administration)	283,431	484,000	200,569	..
Contingencies	252,000	30,000	..	222,000
Total	4,950,000 (8,476*l.* per mile.)	5,550,000 (9,503*l.* per mile.)	*600,000	..

Basis upon which the Original Estimate (in the second column of the Table) was made.

The Chief Engineer's calculations and remarks under each head in December 1899, were as follows:—

"This Estimate has been based on the cost of the work up to September 1899, and has, in most cases, been checked in an independent way, and I have gone very carefully into the items.

"*Surveys.*—The third survey party should complete their work about March next, and the first survey party about June next, and I have simply added to the expenditure, up to last September, the cost of keeping these two parties in the field until the dates given above.

"The porters, I may state, are written on for two years, and get no money until they return to the coast.

* Net Increase.

	£
"At the end of September 1899, there had been spent	62,819
1st Survey Party.	
1st October to 30th June, 1900, at 600*l.* per mensem	5,400
200 porters for 21 months	5,040
3rd Survey Party.	
1st October to 31st March, at 600*l.*	3,600
200 porters for 18 months	4,320
	81,179

"*Land.*—The only additional land that has to be paid for is that on the Mombasa extension, amounting to about 24 acres, which, say, at 850 rupees per acre, will cost 1,360*l.*

"The appeal to the House of Lords in the case of Messrs. Charlesworth's claim is still unsettled. This, I believe, amounts to 2 lakhs of rupees, or 13,300*l.*, and I have thought it advisable, in case it is decided against the Railway, to allow for this in the Estimate.

	£
"The total expenditure to end of September 1899 has been	11,211
Charlesworth's claim still unsettled, pending appeal to House of Lords	15,000
	26,211

"*Earthwork (Formation).*—Under this head I have worked out the final cost from the average of the completed work, allowing 10 miles for the work uncompleted at Kiu and near the Kikuyu Escarpment, and also doubling the heavy work at the Kikuyu and Mau Escarpment. The work is now being done much cheaper than it was during the first three years.

"This estimate is, I think, as accurate a one as it is possible to make under the present circumstances, though I should have preferred taking out the quantities of each bank and cutting had there been time.

"Still, in the present unfinished state of the surveys, it is impossible to get any reliable detailed estimate from a section which has only been compiled from contours.

	Miles.	
"At the end of September 1899, 350 miles of the main line were completed and 30 miles of temporary line; or 380 miles cost ..		428,646
Average cost, $\frac{428646}{380}$ = 1,128*l.*		
To complete there remains as follows:—		
350 to 360 miles average work	10	
360 „ 373 „ heavy work	26	
373 „ 462 „ average work	89	
462 „ 534 „ heavy work	144	
534 „ 582 „ average work	48	
Kedong temporary line	10	
Temporary lines up Mau	15	
Temporary lines down Mau	25	
Total miles	367	
Remaining cost is: 367 miles at 1,128*l.*		413,976
Total earthwork		842,622

"*Bridge-work*—My estimate is based on the average cost of the first 180 miles; this, exclusive of the Salisbury Bridge, and plus the extra cost of carriage, is, I think, a fair average to take for the future cost of bridges and culverts. The viaducts have been taken separately, and it is on these that the greater part of the difference between the two estimates is accounted for. I have estimated for twelve viaducts on the east side of Mau, and nineteen on the west.

	£
"At the end of September 1899, 180 miles were completed for	92,778
Average cost, $\frac{92778}{180} = 515l.$	
Actual cost of Salisbury Bridge	54,890
Extra carriage on materials beyond mile 180 will amount to 15*l.* per mile, so that cost for the remaining portion of the line will be— $515l. + 15l. = 530l.$	
Cost of bridge-work to complete 402 miles, at 530*l.*	213,060
For the viaducts the rate as estimated below has been taken:—	
Kikuyu Viaducts: 123,410 square feet, at 8·5*s.*	52,449
Mau Viaducts (up): 277,510 square feet, at 8·7*s.*	120,717
Mau Viaducts (down): 308,640 square feet, at 8·8*s.*	135,801
	669,695

"*Fencing.*—No remarks.

"*Telegraph.*—No remarks.

"*Ballast.*—Broken ballast, stacked at the side of the line, is now being done for 8 rupees, and, with the scarcity of good ballast in this country, I do not consider it safe to lower the rate.

"*Permanent-way.*—The actual cost of the material, up to and including the cargo of the 'Devonshire II,' works out at 4*l.* 19*s.* 10*d.* f.o.b., and I have therefore taken the cost at 5*l.* per ton.

"Cost of material—	£
660 miles × 160 tons × 5*l.*	528,000
Freight and landing—	
660 miles × 160 tons × 1*l.* 10*s.*	158,400
Haul—	
291 miles; 160 tons × 660 miles × 2½*d.*	320,100
Laying and all other expenses including packing and boxing, 582 miles, at 423*l.*	246,186
	1,252,686

"*Stations and Buildings.*—The stations and quarters are only built to about mile 270. There will have to be a large expenditure at Nairobi for housing the staff, and nothing had been done up to September last. Mombasa station also has to be built, and though the cost at Kilindini has been considerable, there are no subordinates' quarters in excess, though head-quarters have been moved to Nairobi. A very large staff has to be housed at Nairobi, and, with the exception of the officers' houses, which have been moved from Kilindini, the requirements in houses will be largely in excess of Kilindini.

	£
"At the end of September, 1899, the work was completed for 270 miles at a cost of	168,647
Average cost per mile has been $\frac{168647}{270} = 625l.$	
Allow for extra haul 25*l.* per mile, total average cost will be $625l. + 25l. = 650l.$	
To complete 312 miles, at 650*l.*	202,800
	371,447

"*Rolling Stock.*—To the cost up to last September, I have added the cost of the remaining engines and rolling-stock still to be supplied, and I think there can be no doubt that the total as shown is very correct.

		£
"Cost to end of September 1899 was		246,332
Following is value of stock under supply—		
American engines	36 at 2,575*l.*	92,700
Composite carriages	17 „ 600*l.*	10,200
3rd-class carriages	40 „ 330*l.*	13,200
Brake vans	15 „ 279*l.*	4,185
P. O. vans	2 „ 350*l.*	700
Cattle trucks	25 „ 170*l.*	4,250
Low-sided waggons	100 „ 121*l.*	12,100
High „ „	100 „ 200*l.*	20,000
„ „ bogies	40 „ 310*l.*	12,400
Covered goods	110 „ 170*l.*	18,700
Tank waggons	27 „ 220*l.*	5,940
Duplicates, &c.		15,000
		455,707

"*General Charges.*—This has been calculated at the average rate per mile, and the estimate I have made only allows for the rails reaching the Lake, whereas there will be at least another year's work before the permanent works are finished. As, however, the line is open for traffic, larger proportions of this sum become debitable to revenue, and this will, in a measure, counterbalance the expenditure required for this extra time.

"Average cost of 360 miles of line up to September 1899 has been 507*l.* per mile, and the same rate is allowed for the rest of the line—	£
Total cost to end of September 1899	182,385
222 miles × 507*l.*	112,554
	294,939."

Reasons for the figures in the Revised Estimate (in the third column of the Table).

At the time when the Chief Engineer's estimate of December 1899 was prepared, the final surveys and plans were not completed, therefore the data he relied on were imperfect.

(*a.*) He took the cost of so much of the line as was then finished as a guide, and used the actual cost per mile of each main head of account as given in the Table at the beginning of this note, modifying the averages in some cases where his experience led him to believe the cost would differ materially from that in the past.

(*b.*) He had very imperfect knowledge of climatic conditions, which can only be determined after years of observation. The two years following the date of his estimate proved exceptionally wet, and this circumstance materially affected the number of working days available for labourers, and consequently increased the cost of all works.

(*c.*) He assumed that the cost of stores from England, freights, &c., would continue as in the previous year, but the sudden rise in price of coal upset all calculations in this respect, and could not possibly have been foreseen.

(*d.*) He was unable to foresee certain additional works, the advisability of them not becoming apparent until some time after the Estimate was sanctioned.

(*e.*) He was forbidden to enter any sum for the cost of the surplus stores that necessarily remain over on the completion of any large work which, in this case, is expected to amount to about 160,000*l.*

Remarks on each of the above Heads, as lettered.

	£
(*a*) Conditions being similar in all respects, this method gives fairly accurate results, but the actual conditions proved not to be similar.	
*(*b.*) During the year 1901 there was an unexpected loss of over 100 working days, and this would affect the labour bill, general charges, &c., to the amount of at least	120,000
For 1900 a Table of lost working days does not exist, but as the line was blocked for three months, the amount would not be less, and probably is much more, than	90,000
(*c.*) The excess in cost of freights in 1900, due to the increase of rate, is just over	20,000
The extra cost of inland carriage, due to increased price of fuel, amounts to ..	55,000
(*d.*) Certain additional works, including increased waterways, cost	60,000
†Extra works proposed by the Committee	85,000
(*e.*) The value of surplus stores as given above is estimated at	160,000
Total	585,000

This Office can only form a surmise of the amount of the two items under (*b*). They are put down at the lowest probable figures. Assuming them to be fairly correct, it is not possible here to say how they as well as those under (*c*) should be distributed under the different heads of the estimate. The following observations, however, are submitted:—

Surveys.—The excess is unimportant, and is entirely due to the cost of survey for realignment ordered in May 1901, in consequence of Colonel Gracey's Report ("Africa No. 6," of 1901).

Land.—The excess is insignificant.

* During five months ending September 1902, a further loss of fifty working days has been reported.

† Nairobi water supply; Water supply—Port Florence; Automatic brakes; School; Surveys for water.

Earthworks.—In the absence of the sections detailed quantities calculated therefrom were not available for the estimate. The Chief Engineer, it may be seen, took an average from the work already executed, and increased the mileage of the difficult portions in such proportion as he judged would produce a fairly accurate result. Owing to the site of the works being covered with forest for a great part, and only a narrow strip cleared for survey, it was most difficult to judge of the quantities in this manner, and the result was that they were under-estimated. He also hoped for lower rates, but the bad weather experienced during the two succeeding years not only prevented this hope being realized, but increased the rate owing to the number of days during which the labourers could not work.

The quantities were 40 per cent. higher than his estimate, and the cost per unit 33 per cent. more. These two combined account for the excess.

Bridge-work.—The heavy rains of 1900 showed that the waterways provided at several points were insufficient, and these had to be increased at a cost, as shown by the Chief Engineer in a letter dated 11th January last, of just under 24,000*l.* The extra cost, in carriage and in some materials sent out since his first Estimate was made, fully covers the remainder of the excess, but the cause cannot be ascertained here.

Fencing, &c.—This item includes gradient posts, mile posts, level crossings, fencing round changing station-yards and workshops. The railway generally is unfenced. The excess is due to some increase in the amount of fencing to prevent thieving, also partly to extra cost of carriage and labour.

Telegraph.—The delays owing to weather on Mau, the extra cost of carriage, and extra wire required to make up the third wire to Port Florence and to replace wire stolen by natives, account for the excess.

Ballast.—By working slowly and with indigenous labour it has been found that a lower rate may be taken, which accounts for the less demand under this head.

Permanent Way.—Up to the date of the original estimate the average cost of materials in England was 6*l.* 10*s.* per ton as against the Chief Engineer's 5*l.*, and the Committee corrected the Chief Engineer's figures accordingly. During 1900 there was a further rise in price, which amounted to 2*l.* in England and 15*s.* per ton on freight, and an increase on carriage in East Africa. The quantity of materials ordered under these conditions was for 36 miles of line, and the excess cost was nearly 16,000*l.*

On the first 80 miles of line laid with wooden sleepers it was found that these had decayed so rapidly that it was necessary to renew a considerable number (see Colonel Gracey's Report, "Africa No. 6," of 1901, p. 12). For this purpose 1,700 tons of steel sleepers were sent out and inserted at a cost of 17,000*l.*

The original length of deviations estimated in 1899 was 80 miles, while the amount actually constructed came to 96½ miles. The cost of laying these and again removing the material he included in the sum of 423*l.* per mile of permanent line, as shown in his estimate for "laying and all other expenses." This allowance was based on a length of 30 miles out of a total of 350 miles (*vide* his remarks), or just 8½ per cent., while the remainder as executed is 66½ miles out of 234 miles, or nearly 29 per cent. It is obvious, therefore, that the rate which should have been applied to the 234 miles ought to have been considerably higher. The taking up of the temporary roads he now reports has cost him much more than he expected, the loss of small materials, fish-bolts, nuts, and keys, has amounted to as much as 50 per cent., due to the natives stealing these small articles. The actual unlinking and removal costs practically the same as laying, while loading into trucks and taking on to the next point where required has to be added. Of these latter expenses he had had practically no experience when the 1899 estimate was prepared, because most of the temporary lines laid down in the earlier years were not removed until 1901. The increased cost of labour, due to weather, and cost of carriage assisted in this extra cost of removing deviations.

As the materials remained for the most part at the coast until required at railhead, and the rope inclines were not in working order until May 1900, the bulk of the material for the remainder of the line had to be carried forward when the cost of carriage in East Africa had become high owing to dear fuel. The extra cost of this carriage would be about 35,000*l.*

The total of the sums mentioned above amount in all to 68,000*l.*, and practically accounts for the excess.

Stations and Buildings.—This head includes station buildings, workshops, and stores buildings, quarters for staff and hospitals, and station machinery, the latter

including points and crossing, signals, watering appliances for engines, ashpits, engine-sheds, &c., and general water supply for stations.

The sum of 168,647*l.*, which he quotes for 270 miles, is shown in the accounts under four sub-heads as follows :—

	£
Stations and offices	25,225
Workshops and stores	16,924
Staff quarters	75,505
Station machinery	50,993
Total	168,647

For the remainder of the line he took the mileage rate obtained by dividing the total by 270 miles, making an allowance for extra cost of carriage for the extra distance, and multiplying this rate by 312, the distance remaining to the Lake. This average evidently did not allow for what is required of a station like Nairobi, with the main workshops and staff head-quarters, and these should have been provided for. The staff quarters at Nakuro were also underestimated.

The whole of the Nairobi works were completed by the end of May 1901, and the total expenditure to that date, and difference between it and the expenditure to end of September 1899, are as follows :—

	To end of May, 1901.	To end of September, 1899.	Difference.
	£	£	£
1. Stations and offices	53,384	25,225	28,159
2. Workshops and stores.. ..	68,710	16,924	51,786
3. Staff quarters, &c.	215,117	75,505	139,612
4. Station machinery	109,654	50,993	58,661

The differences under the second and third items, viz., 51,786*l.* and 139,612*l.*, represent the cost of the workshops and staff head-quarters, for which no provision was made. Under the first and last the differences fairly represents that due to mileage.

The cost of these works was much enhanced by the railway being blocked for three months during the early part of 1900 by heavy rains, which reduced the "cotton-soil" embankments on the Athi Plains to a quagmire, so that even during breaks of fine weather materials could not be trained up and consequently the works could not be pushed on.

The further estimate under this head also provides for the Nairobi and other water supplies at M'toto Andei and Port Florence, for which data were not available when the original estimate was made. Thus the existence of the springs found last year 3 miles from M'toto Andei Station were not known to the engineers previously, and it was surmised that this station and Kenani would have to be supplied by train, therefore no sum could be entered in the estimate.

The temporary station in the Kedong Valley was in use for nearly a year longer than was at first contemplated, and better arrangements had to be made for repairing engines, &c., and for the staff. The extra time was due largely to the failure of the English contractors for the Kikuyu Viaducts to keep to their engagements as to time of delivery; in this way the station cost more to construct and more to remove. By station is meant the whole yard, including watering arrangements and other appliances, not the mere building for traffic work.

Rolling Stock.—In regard to the increase under this head, the figure of the original estimate was made in this Office, and was less accurate than that made by the Chief Engineer. Every effort was made to ascertain the total expenditure in England, and allowances for freights and for erecting, but the actual expenses were about 50,000*l.* over these calculations. Since then the accidents and loss caused by breakages of draw gear, and the provision of safety appliances, have further increased the amount of excess to the figures now given. Thus safety chains, &c., cost 15,000*l.*, and the automatic brakes are estimated at 37,000*l.*, while the repairs to stock injured by accidents is a considerable item.

The cost of repairs to rolling-stock, due to accidental parting of trains on the steep inclines already incurred, would have paid for a considerable portion of the cost of these safety appliances.

General Charges.—At the time this estimate was prepared, the Chief Engineer hoped that the rails would reach the Lake about the middle of 1901. He only estimated those charges up to the date of the rails reaching the Lake, surmising that after that date a large proportion of the staff would be charged to Revenue Account; but it has been decided that until the rails are on the permanent alignment, all must be charged to capital.

The Chief Engineer also used the average from the commencement of operations when the charges were small, instead of taking the monthly cost at date of making his estimate, and allowing at that rate for the remainder of the period. Applying this average to the remaining 222 miles, and only up to July 1901, he estimated the additional general charges at 112,554*l.* Estimated, however, at the monthly rate for September 1899, and up to the end of March 1903, the cost would be 335,370*l.* This, added to the expenditure up to September 1899 of 182,385*l.*, would make a total of 517,755*l.*; but, as the staff is under gradual reduction, there is a saving to be set off against this figure, and the present estimate is for 484,000*l.*

General Remarks.

It may be seen from the foregoing that the Chief Engineer did not make out an estimate in detail by sub-heads, as is the usual course when full surveys have been completed before sanction is given for a work, and the final surveys not being finished, it is obvious he could not have gone into details.

It is also evident that in the peculiar circumstances of East Africa an estimate made on quantities and rates per unit cannot be relied on when labourers have to be paid and fed whether the weather permits them to work or not, and where the work is spread over such a period as allows for fluctuations in the prices of imported stores.

Experience has now shown that the weather conditions in that portion of East Africa through which the first 330 miles of the line passes are very different from those which prevail on the remaining 252 miles, but more especially so on the last 130 miles, or from the place where the ascent of the Mau range begins.

Even in the first portion referred to heavy rains during the first half of 1900 blocked for nearly three months all traffic across the Kapiti and Athi Plains, where, at the time, the line was unballasted. This block kept large numbers of workpeople and supervising staff practically idle for want of materials, which had to be brought from the coast, including those for the workshops, stores, and quarters for mechanics, &c., at Nairobi. This wet and unseasonable weather retarded the works between miles 250 and 280, then in full progress, and washed out the line in several places, necessitating extra waterways, *e.g.*, a 40-foot span bridge had in one place to be substituted for an 18-inch pipe, and a bridge of three spans of 20 feet each had to be built where previously no appearance of a water-course existed.

It is to be observed that even in India, where the conditions have been systematically studied for nearly a century, each Administration Report (*vide* that for 1901 [Cd. 1234], pp. 19–21) gives details of flood damages repaired at heavy cost, and requiring the provision of additional bridging at the most unexpected points. In East Africa the records of rainfall are necessarily meagre. Moreover, the rank vegetation at present prevents rainfall from flowing off quickly, and so far heavy rainstorms have tested only a few places; but, should cultivation cause the clearance from jungle of considerable areas, it seems likely that many drains and culverts may have to be enlarged.

In this same year of 1900 a sudden rise in the price of coal from about 13*s.* to 27*s.* per ton increased the cost of freights from an average of 1*l.* 2*s.* 6*d.* to a maximum of 1*l.* 17*s.* 6*d.* per ton. The rise in the price of coal also increased the cost of carriage of all materials on the line proportionately until arrangements were made for the introduction of Indian coal.

F. L. O'CALLAGHAN.

November 1902.

AFRICA. No. 5 (1902).

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CORRESPONDENCE

RESPECTING

SLAVERY AND THE SLAVE TRADE

IN

EAST AFRICA AND THE ISLANDS OF ZANZIBAR AND PEMBA.

[In continuation of "Africa No. 4 (1901)."]

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